

1 **THE EMBODIMENTS OF THE INVENTION IN WHICH AN**
2 **EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS**
3 **FOLLOWS:**
4

5 1. Apparatus for counting objects comprising:

6 a bowl adapted for holding a plurality of the objects therein and
7 rotatable about an axis in a housing, the bowl further comprising, a first annular
8 inclined surface portion adjacent a bottom of the bowl, a second annular inclined
9 surface portion adjacent a top of the bowl, and an annular, substantially flat ledge
10 intermediate and interconnecting the first and second inclined surfaces;

11 a spiral guide ramp held stationary within the rotating bowl for guiding
12 the objects from the bottom of the bowl to the ledge and from the ledge to the top of
13 the bowl, the ramp forming a gap adjacent the ledge;

14 means for periodically altering an angular velocity of the rotation of the
15 bowl so as to cause the objects on the ledge to either distribute individually
16 therealong and traverse the gap to be guided to the top of the bowl or to fall through
17 the gap to return to the bottom of the bowl;

18 a slide for guiding the objects individually from the top of the bowl to
19 one of either a first collecting means or a second collecting means;

20 a counter for counting individual objects guided to the first collecting
21 means; and

22 a gate at a first position for guiding individual objects into the first
23 collecting means and when a predetermined number of objects have been collected
24 in the first collecting means the gate being actuable to a second position for guiding
25 individual objects into the second collecting means.

1 2. The apparatus as described in claim 1 wherein the means for
2 altering the angular velocity of the rotation of the bowl comprises a controller.

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4 3. The apparatus as described in claim 2 wherein the controller
5 alters at least one of a plurality of variables comprising a speed of rotation, a
6 direction of rotation and a number of rotations in a first direction.

7

8 4. The apparatus as described in claim 2 wherein the controller
9 alters the angular velocity of the rotation of the bowl by rotating in a first direction,
10 performing a partial rotation in a reverse direction and resuming rotation in the first
11 direction.

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13 5. The apparatus as described in claim 4 wherein the controller
14 further alters at least one of a speed of rotation and a number of rotations in the first
15 direction.

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17 6. The apparatus as described in claim 3 wherein the controller
18 stores one or more algorithms each of which implement an alteration of at least one
19 of the plurality of variables.

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21 7. The apparatus as described in claim 6 wherein the counter
22 determines collection characteristics of the object.

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1 8.. The apparatus as described in claim 7 wherein the controller
2 selects one of the plurality of algorithms stored therein in response to the collection
3 characteristics of the objects.

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5 9. The apparatus as described in claim 7 wherein the collection
6 characteristics of the object comprise at least a rate of presentation of the objects at
7 the counter.

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9 10. The apparatus as described in claim 7 wherein the counter
10 further comprises a height-discriminating sensor for determining collection
11 characteristics of the object.

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13 11. The apparatus as described in claim 10 wherein the height-
14 discriminating sensor is a plurality of vertically-stacked optical sensors.

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16 12. The apparatus as described in claim 11 wherein the collection
17 characteristics are a size or a shape of the objects.

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19 13. The apparatus as described in claim 11 wherein the controller
20 selects one of a plurality of algorithms stored therein in response to a size and the
21 shape of the object.

22

1 14. The apparatus as described in claim 1 wherein the spiral guide
2 ramp further comprises a flare extending from at least a portion of a lower edge of
3 the ramp to assist in guiding the objects therealong.

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5 15. The apparatus as described in claim 1 wherein the objects are
6 pharmaceuticals.

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8 16. The apparatus as described in claim 1 wherein the counter is a
9 photo-emitter and a corresponding detector.

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11 17. Apparatus for counting objects comprising:
12 a bowl adapted for holding a plurality of the objects therein and
13 rotatable about an axis in a housing, the bowl further comprising, a first annular
14 inclined surface portion adjacent a bottom of the bowl, a second annular inclined
15 surface portion adjacent a top of the bowl, and an annular, substantially flat ledge
16 intermediate and interconnecting the first and second inclined surfaces;
17 a slide for guiding the objects individually from the top of the bowl to
18 one of either a first collecting means or a second collecting means;
19 a counter positioned at a bottom of the slide for counting the objects
20 as the individual objects are guided to the first collecting means;
21 a gate at a first position for guiding individual objects into the first
22 collecting means and when a predetermined number of objects have been collected

1 in the first collecting means the gate being actuable to a second position for guiding
2 individual objects into the second collecting means; and

3 a spiral guide ramp held stationary within the rotating bowl for guiding
4 the objects from the bottom of the bowl to the ledge and from the ledge to the top of
5 the bowl, and having a flare extending from at least a portion of a lower edge of the
6 spiral guide ramp to assist in guiding the objects therealong.

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8 18. The apparatus as described in claim 17 further comprising
9 means for periodically altering an angular velocity of the rotation of the bowl so as to
10 cause the objects on the ledge to distribute individually therealong and traverse the
11 gap to be guided to the top of the bowl or to fall through a gap in the spiral guide
12 ramp to return to the bottom of the bowl.

13

14 19. The apparatus as described in claim 18 wherein the spiral
15 guide ramp further comprises;

16 an inner spiral, an outer spiral and the gap being formed
17 therebetween; and

18 a downwardly depending flare formed at an end of the inner spiral for
19 aiding in directing objects which are not distributed individually on the annular
20 substantially flat surface portion through the gap and into the bottom of the bowl.

21

1 20. The apparatus as described in claim 18 wherein the spiral
2 guide ramp further comprises;

3 an inner spiral, an outer spiral and the gap being formed
4 therebetween; and

5 a downwardly depending flare formed at a beginning of the outer
6 spiral for aiding in maintaining objects which are distributed individually on the
7 annular substantially flat surface portion.

8
9 21. A method of counting objects adapted for use with a spiral
10 guide ramp held stationary in a bowl, the method comprising:

11 placing the objects in a bottom of the bowl,

12 rotating the bowl so as to cause the objects to be guided along the
13 stationary spiral guide ramp on a first annular inclined surface portion from a bottom
14 of the bowl to an annular, substantially flat ledge and for guiding the objects from
15 the ledge to the top of the bowl; and

16 periodically altering an angular velocity of the rotation of the bowl so
17 as to distribute objects on the ledge individually therealong and traverse a gap in
18 the ramp adjacent the ledge to be guided to the top of the bowl or to fall through the
19 gap to return to the bottom of the bowl.

20
21 22. The method as described in claim 21 further comprising altering
22 at least one of a plurality of variables comprising a speed of rotation, a direction of
23 rotation and a number of rotations in a first direction.

1 23. The method as described in claim 22 further comprising altering
2 the angular velocity of the rotation of the bowl by rotating in a first direction,
3 performing a partial rotation in a reverse direction and resuming rotation in the first
4 direction.

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6 24. The method as described in claim 22 further comprising altering
7 the angular velocity in response to a collection characteristic of the object.

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9 25. Apparatus for counting objects comprising:

10 a bowl adapted for holding a plurality of the objects therein and
11 rotatable about an axis in a housing, the bowl further comprising, a first annular
12 inclined surface portion adjacent a bottom of the bowl, a second annular inclined
13 surface portion adjacent a top of the bowl, and an annular, substantially flat ledge
14 intermediate and interconnecting the first and second inclined surfaces;

15 a spiral guide ramp held stationary within the rotating bowl for guiding
16 the objects from the bottom of the bowl to the ledge and from the ledge to the top of
17 the bowl, the ramp forming a gap adjacent the ledge;

18 a controller for periodically altering an angular velocity of the rotation
19 of the bowl so as to cause the objects on the ledge to either distribute individually
20 therealong and traverse the gap to be guided to the top of the bowl or to fall through
21 the gap to return to the bottom of the bowl;

22 a slide for guiding the objects individually from the top of the bowl to
23 one of either a first collecting means or a second collecting means;

1 a counter for counting individual objects guided to the first collecting
2 means; and

3 a gate at a first position for guiding individual objects into the first
4 collecting means and when a predetermined number of objects have been collected
5 in the first collecting means the gate being actuable to a second position for guiding
6 individual objects into the second collecting means.

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8 26. The apparatus as described in claim 25 wherein the controller
9 alters at least one of a plurality of variables comprising a speed of rotation, a
10 direction of rotation and a number of rotations in a first direction.

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12 27. The apparatus as described in claim 26 wherein the controller
13 alters the angular velocity of the rotation of the bowl by rotating in a first direction,
14 performing a partial rotation in a reverse direction; and resuming rotation in the first
15 direction.

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17 28. The apparatus as described in claim 26 further comprising a
18 plurality of algorithms stored in the controller, each of the plurality of algorithms
19 comprising an alteration of at least one of the plurality of variables.

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21 29. The apparatus as described in claim 28 wherein the counter
22 determines collection characteristics of the object.

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1 30. The apparatus as described in claim 29 wherein the controller
2 selects one of the plurality of algorithms stored therein in response to a collection
3 characteristic of the object.

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5 31. The apparatus as described in claim 30 wherein the collection
6 characteristic of the object is at least a rate of presentation of the object at the
7 counter.

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9 32. The apparatus as described in claim 29 wherein the counter
10 further comprises a height-discriminating sensor.

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12 33. The apparatus as described in claim 32 wherein the height-
13 discriminating sensor is a plurality of vertically-stacked sensors.

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15 34. The apparatus as described in claim 33 wherein the controller
16 is capable of determining a shape of the objects from the collection characteristic of
17 the object.

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19 35. The apparatus as described in claim 33 wherein the controller
20 selects one of a plurality of algorithms stored therein as a result of a shape of the
21 object.

1 36. The apparatus as described in claim 25 wherein the controller
2 is a micro-computer.